equivalent arrangements included within the spirit and the scope of the appended claims.

WHAT IS CLAIMED IS:

1. A tiltable-body apparatus comprising:

a frame member;

a tiltable body; and

a pair of torsion springs having a twisting longitudinal axis, said torsion springs being disposed along the twisting longitudinal axis opposingly with said tiltable body being interposed, said torsion springs supporting said tiltable body flexibly and rotatably about the twisting longitudinal axis relative to said frame member, said torsion springs including a plurality of planar portions, compliant directions of which intersect each other when viewed along a direction of the twisting longitudinal axis, and a center of gravity of said tiltable body being positioned on the twisting longitudinal axis of said torsion springs.

2. The tiltable-body apparatus of claim 1, wherein said tiltable body is a planar tiltable body, and at least one of said planar portions of said torsion springs is slant to said planar tiltable body.

3. The tiltable-body apparatus of claim 1, wherein a cross-sectional shape of said each torsion spring perpendicular to the twisting longitudinal axis is 90-degree or 180-degree rotationally symmetric, and said each torsion spring comprises a plurality of planar portions.

4. The tiltable-body apparatus of claim 1, wherein said each

torsion spring comprises a plurality of separate planar portions, longitudinal axes of which are set parallel to each other, and compliant directions of which intersect each other when viewed along the direction of the twisting longitudinal axis.

5. The tiltable-body apparatus of claim 1, wherein a cross-sectional shape of said each torsion spring perpendicular to the twisting longitudinal axis is symmetric with respect to a plane including the twisting longitudinal axis.

6. The tiltable-body apparatus of claim 1, wherein said torsion springs are formed of a single crystal material.

7. The tiltable-body apparatus of claim 6, wherein said torsion springs are formed of a single crystal silicon.

8. The tiltable-body apparatus of claim 7, wherein said tiltable body is a planar tiltable body, at least one of said planar portions of said torsion springs has a surface slant to said planar tiltable body, and said slant surface is a (111) face of said single crystal silicon.

9. The tiltable-body apparatus of claim 1, wherein said frame member, said tiltable body, and said torsion springs are integrally formed from a substrate of a single crystal material.

10. The tiltable-body apparatus of claim 9, wherein said single crystal material is a (100) single crystal silicon substrate, said torsion

springs are formed by anisotropically etching said single crystal silicon substrate, said tiltable body is a planar tiltable body, at least one of said planar portions of said torsion springs has a surface slant to said planar tiltable body, and said slant surface is a (111) face of said single crystal silicon substrate relative to said (100) substrate face.

11. The tiltable-body apparatus of claim 10, wherein a face relative to said (100) substrate face of a root portion of said each torsion spring, which connects to said frame member or said tiltable body, is a (111) face of said single crystal silicon substrate.

12. The tiltable-body apparatus of claim 1, wherein said torsion springs are formed by performing deep etching, and said each torsion spring is defined by faces perpendicular to said frame member and faces parallel to said frame member.

13. The tiltable-body apparatus of claim 1, wherein a cross section of said each torsion spring perpendicular to the twisting longitudinal axis has a shape of one of V, reversed-V, X, slash, broken-V, broken-reversed-V, crisscross, broken-crisscross, H, broken-H, N, and angular S.

14. The tiltable-body apparatus of claim 1, wherein angles of said torsion springs are rounded by isotropic etching such that stress concentration on said angles of said torsion springs is reduced.

15. The tiltable-body apparatus of claim 1, wherein cross sections of said torsion springs, which are disposed along the twisting longitudinal

axis opposingly with said tiltable body being interposed, perpendicular to the twisting longitudinal axis are the same.

16. The tiltable-body apparatus of claim 1, wherein cross sections of said torsion springs, which are disposed along the twisting longitudinal axis opposingly with said tiltable body being interposed, perpendicular to the twisting longitudinal axis are different from each other.

17. The tiltable-body apparatus of claim 16, wherein cross sections of said torsion springs, which are disposed along the twisting longitudinal axis opposingly with said tiltable body being interposed, perpendicular to the twisting longitudinal axis are symmetric with each other with respect to a plane including the twisting longitudinal axis.

18. The tiltable-body apparatus of claim 1, wherein said tiltable body is a planar tiltable body, and cross sections of said torsion springs perpendicular to the twisting longitudinal axis are symmetric with each other with respect to a plane including the twisting longitudinal axis and parallel to said planar tiltable body.

19. The tiltable-body apparatus of claim 4, wherein said each torsion spring comprises a plurality of separate planar torsion bars, and a cross section of said each torsion spring is symmetric with respect to a vertical line.

20. The tiltable-body apparatus of claim 4, wherein said each torsion spring comprises a plurality of separate planar torsion bars, and

a cross section of said torsion spring is symmetric with respect to a horizontal line and a vertical line.

21. The tiltable-body apparatus of claim 1, wherein said frame member includes an inner frame member and an outer frame member, said tiltable body includes an inner tiltable body and an outer tiltable body which is said inner frame member for supporting said inner tiltable body through a pair of first torsion springs and is supported by said outer frame member through a pair of second torsion springs, said inner tiltable body is supported flexibly and rotatably about a first twisting longitudinal axis of a pair of said first torsion springs, said outer tiltable body is supported flexibly and rotatably about a second twisting longitudinal axis of a pair of said second torsion springs, and pairs of said first and second torsion springs are disposed along the first and second twisting longitudinal axes opposingly with said inner and outer tiltable body being interposed, respectively.

22. The tiltable-body apparatus of claim 21, wherein the first and second twisting longitudinal axes extend forming an angle of 90 degrees.

23. The tiltable-body apparatus of claim 1, further comprising means for detecting a relative displacement between said frame member and said tiltable body, and wherein the apparatus is constructed as a mechanical-amount sensor.

24. The tiltable-body apparatus of claim 1, further comprising driving means for driving said tiltable body relative to said frame member,

and wherein the apparatus is constructed as an actuator.

25. The tiltable-body apparatus of claim 24, wherein said driving means comprises a stationary core, a coil wound on said stationary core, and a moving core bonded to said tiltable body.

26. The tiltable-body apparatus of claim 1, further comprising driving means for driving said tiltable body relative to said frame member, and light deflecting means for deflecting a beam of light impinging on said tiltable body, which is provided on said tiltable body, and wherein the apparatus is constructed as an optical deflector.

27. The tiltable-body apparatus of claim 26, wherein said driving means comprises a stationary core, a coil wound on said stationary core, and a moving core bonded to said tiltable body.

28. The tiltable-body apparatus of claim 26, wherein said light deflecting means is one of a light reflective mirror and a diffraction grating.

29. A tiltable-body apparatus comprising:

a frame member;

a planar tiltable body; and

a pair of torsion springs having a twisting longitudinal axis, said torsion springs being disposed along the twisting longitudinal axis opposingly with said tiltable body being interposed, said torsion springs supporting said tiltable body flexibly and rotatably about the twisting

longitudinal axis relative to said frame member, said torsion springs including a plurality of planar portions, and at least one of said planar portions of said torsion springs being slant to said planar tiltable body.

30. A tiltable-body apparatus comprising:

a frame member;

a planar tiltable body; and

a pair of torsion springs having a twisting longitudinal axis, said torsion springs being disposed along the twisting longitudinal axis opposingly with said tiltable body being interposed, said torsion springs supporting said tiltable body flexibly and rotatably about the twisting longitudinal axis relative to said frame member, a cross-sectional shape of said each torsion spring perpendicular to the twisting longitudinal axis being 90-degree or 180-degree rotationally symmetric, said each torsion spring including a plurality of planar portions, and compliant directions of said planar portions intersecting each other when viewed along a direction of the twisting longitudinal axis.

31. A tiltable-body apparatus comprising:

a frame member;

a planar tiltable body; and

a pair of torsion springs having a twisting longitudinal axis, said torsion springs being disposed along the twisting longitudinal axis opposingly with said tiltable body being interposed, said torsion springs supporting said tiltable body flexibly and rotatably about the twisting longitudinal axis relative to said frame member, said each torsion spring including a plurality of separate planar portions, longitudinal axes of

which are set parallel to each other, and compliant directions of said separate planar portions intersecting each other when viewed along a direction of the twisting longitudinal axis

32. A scanning type display comprising:

(a) a modulatable light source;

(b) an optical deflector including:

a frame member;

a tiltable body; and

a pair of torsion springs having a twisting longitudinal axis, said torsion springs being disposed along the twisting longitudinal axis opposingly with said tiltable body being interposed, said torsion springs supporting said tiltable body flexibly and rotatably about the twisting longitudinal axis relative to said frame member, said torsion springs including a plurality of planar portions, compliant directions of which intersect each other when viewed along a direction of the twisting longitudinal axis, and a center of gravity of said tiltable body being positioned on the twisting longitudinal axis of said torsion springs;

driving means for driving said tiltable body relative to said frame member; and

light deflecting means for deflecting a beam of light impinging on said tiltable body from said light source, said light deflecting means being provided on said tiltable body;

(c) a picture display screen on which the beam of light from said deflecting means is projected; and

(d) control means for controlling modulation of said modulatable light source and operation of said tiltable body of said optical deflector

in an interlocking manner.

33. A method of fabricating a tiltable-body apparatus which includes a frame member formed of a (100) single crystal silicon substrate, a tiltable body formed of the (100) single crystal silicon substrate, and a pair of torsion springs having a twisting longitudinal axis and formed of the (100) single crystal silicon substrate, the torsion springs being disposed along the twisting longitudinal axis opposingly with the tiltable body being interposed, the torsion springs supporting the tiltable body flexibly and rotatably about the twisting longitudinal axis relative to the frame member, and the torsion springs including a plurality of planar portions defined by (100) and (111) faces of the single crystal silicon substrate, compliant directions of which intersect each other when viewed along a direction of the twisting longitudinal axis, said method comprising the steps of:

depositing mask layers on both upper and lower surfaces of the (100) single crystal silicon substrate, respectively;

patterning the mask layers in accordance with configurations of the tiltable body and the torsion springs; and

anisotropically etching the (100) single crystal silicon substrate using the patterned mask layers.

34. The method of claim 33, wherein said anisotropic etching is performed using an alkaline solution.

35. The method of claim 33, further comprising a step of rounding angles of the torsion springs by isotropic etching such that stress

concentration on the angles of the torsion springs is reduced.

36. A method of fabricating a tiltable-body apparatus which includes a frame member formed of a planar substrate, a tiltable body formed of the planar substrate, and a pair of torsion springs having a twisting longitudinal axis and formed of the planar substrate, the torsion springs being disposed along the twisting longitudinal axis opposingly with the tiltable body being interposed, the torsion springs supporting the tiltable body flexibly and rotatably about the twisting longitudinal axis relative to the frame member, and the torsion springs including a plurality of planar portions defined by faces perpendicular to the planar substrate and faces parallel to the planar substrate, compliant directions of which intersect each other when viewed along a direction of the twisting longitudinal axis, said method comprising the steps of:

depositing mask layers on both upper and lower surfaces of the planar substrate, respectively;

patterning the mask layers in accordance with configurations of the tiltable body and the torsion springs;

performing a deep etching of the planar substrate from one surface of the planar substrate; and

performing a deep etching of the planar substrate from the other surface of the planar substrate.

37. The method of claim 36, wherein the planar substrate is a silicon substrate.